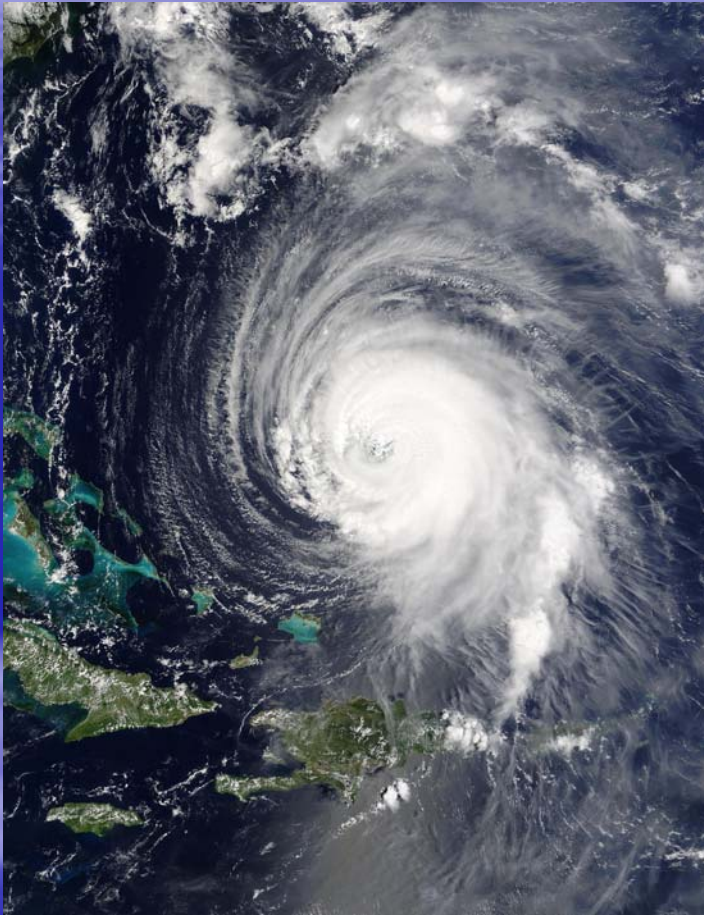


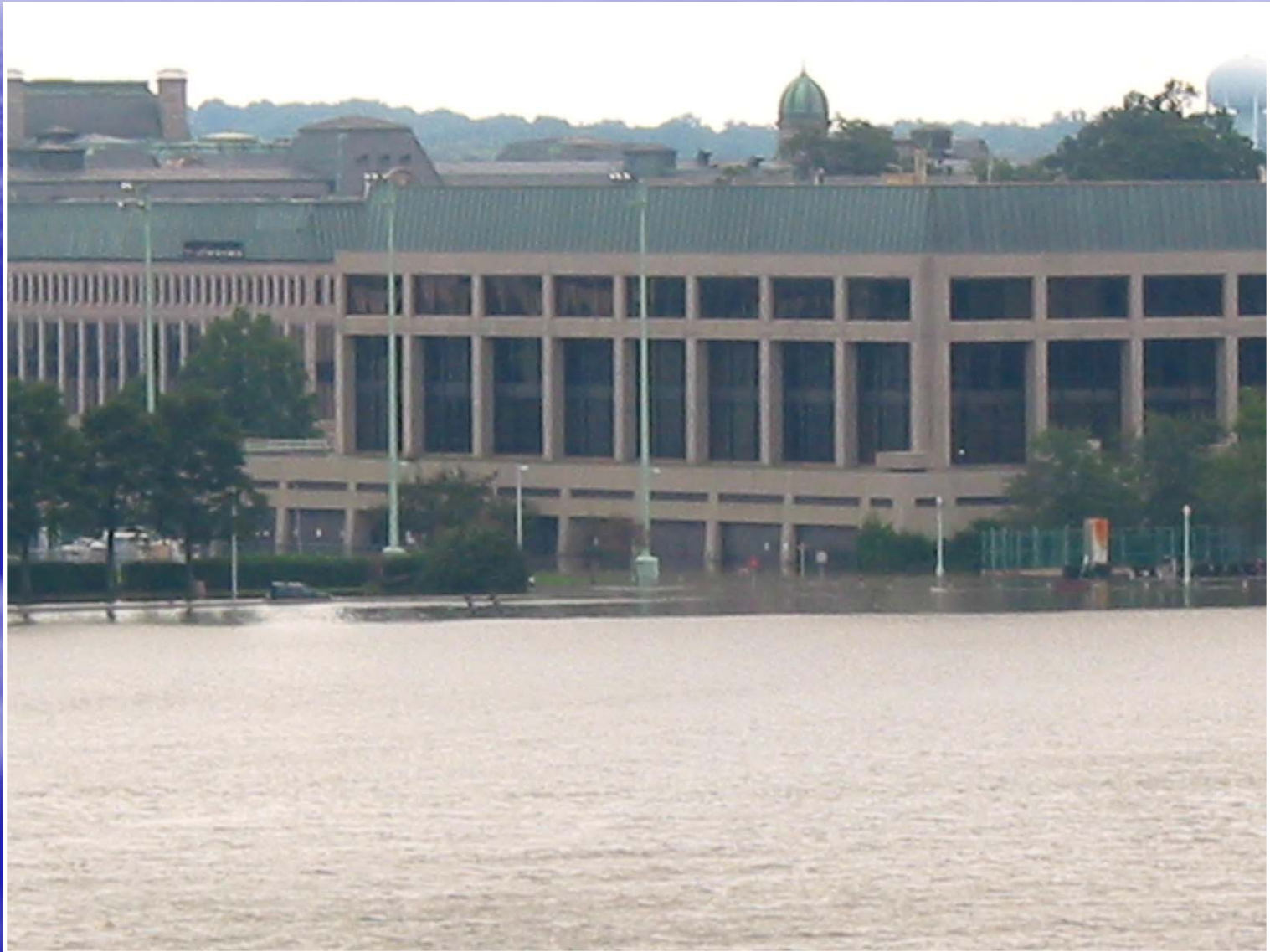
Class of '07
Mechanical Engineering Open
House

Welcome!

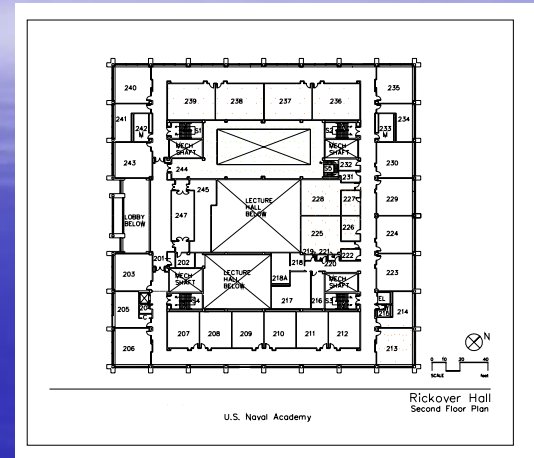
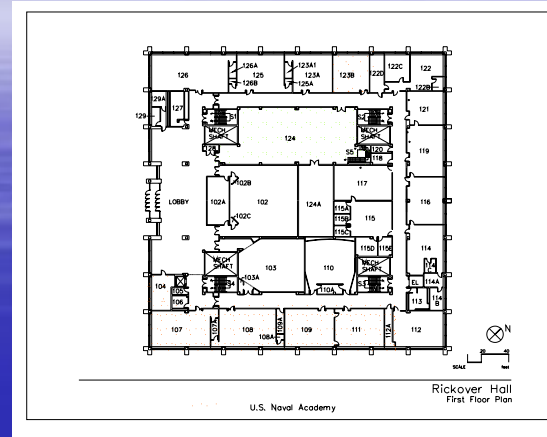
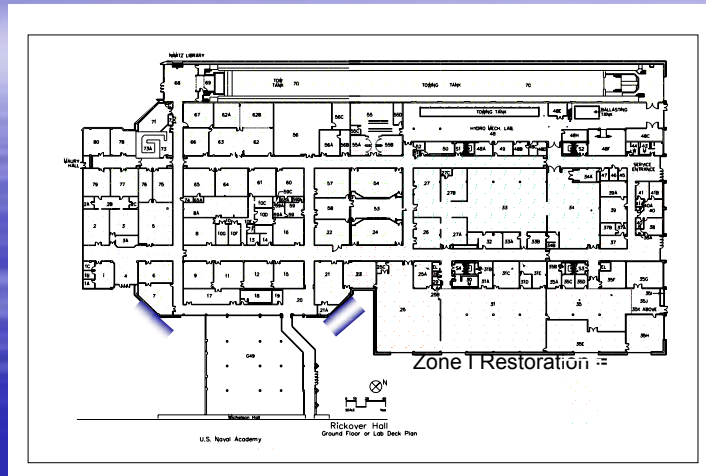
Open House Lab Tours?



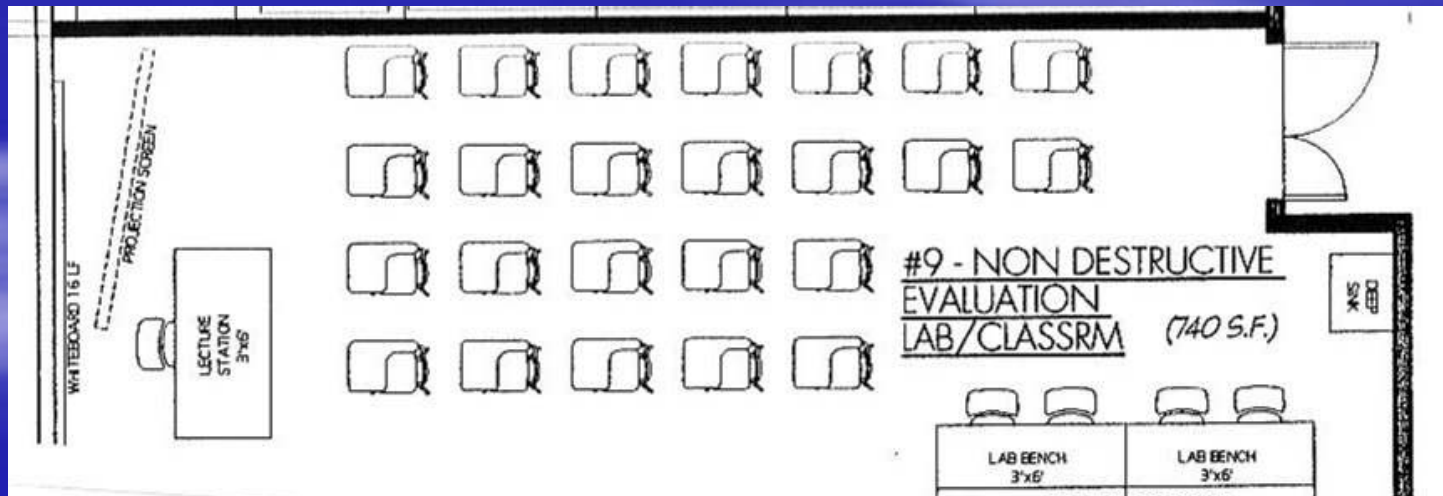
Open House Lab Tours?



Isabel Recovery – Better Than Before

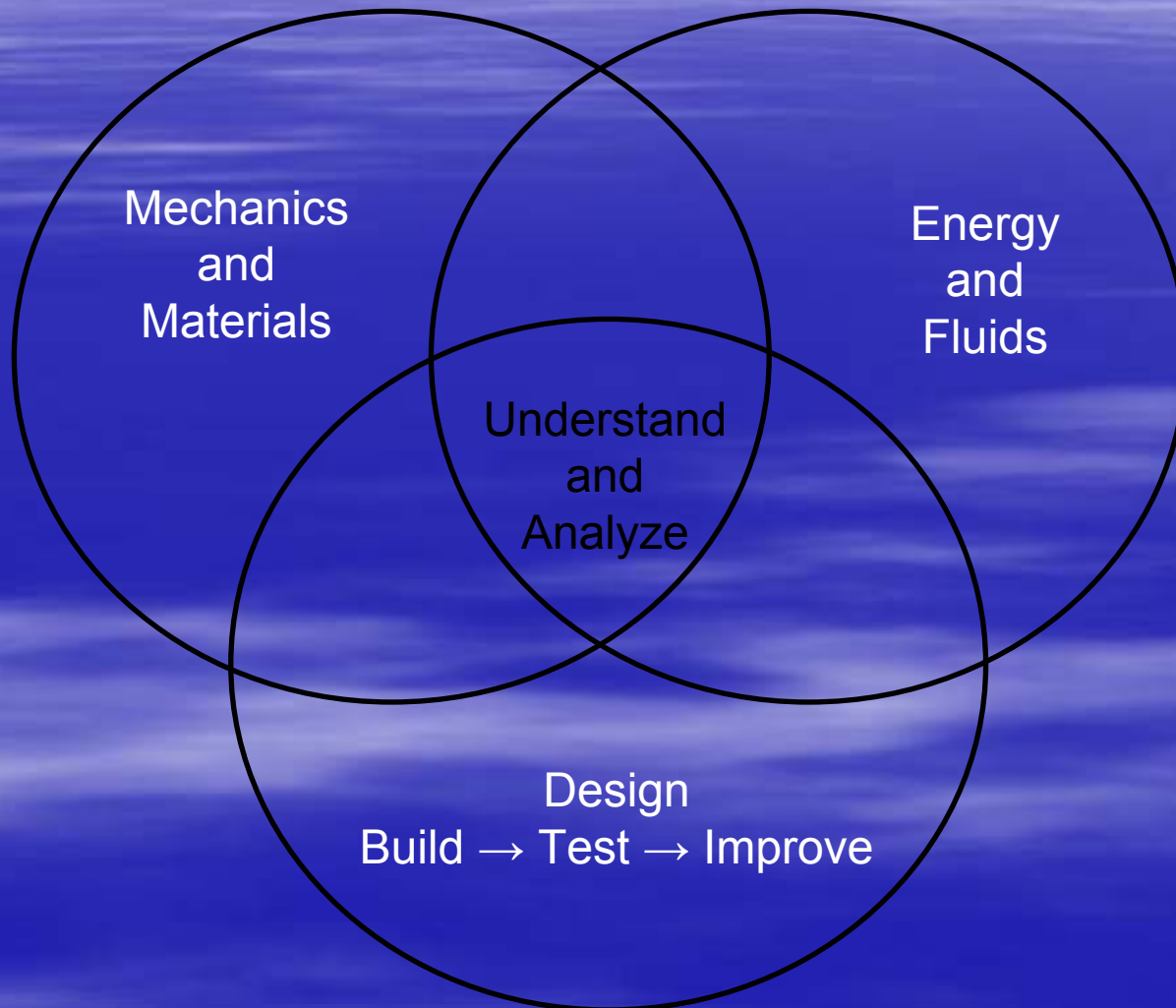


Reorganized spaces on the labdeck, 1st deck and 2nd deck



New labs, classrooms and project rooms

What is Mechanical Engineering?



Mechanics and Materials

Mechanics and Materials

■ Courses

- Statics
- Dynamics
- Strength of Materials
- Materials Science

■ Concepts

- How are loads transmitted through a structure?
- How do you design a structure that can withstand an earthquake?
- How do design attributes affect structural performance?
- How do you select materials that will not fail?

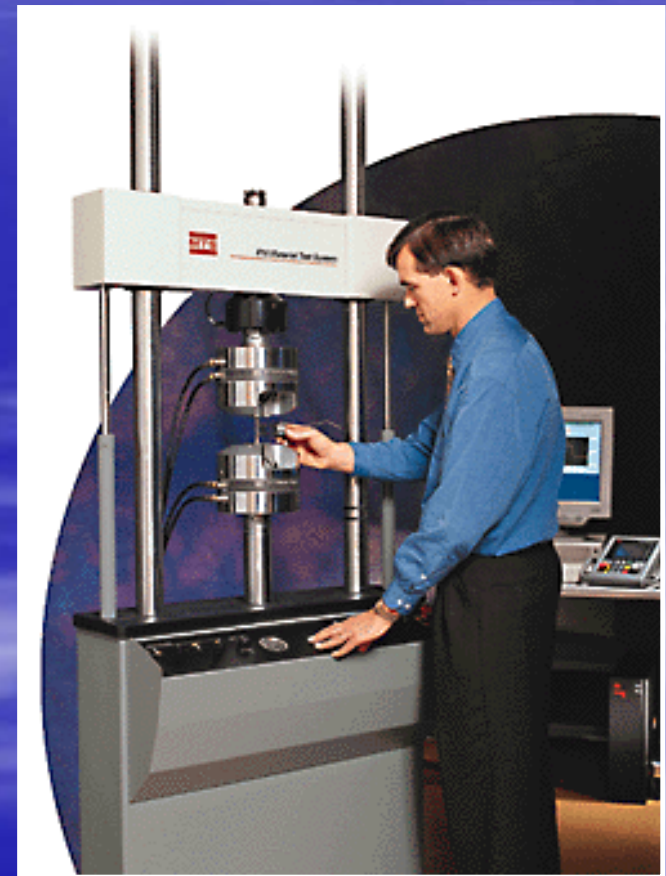
Mechanics and Materials Lab Facilities



Impact tester



Fatigue tester

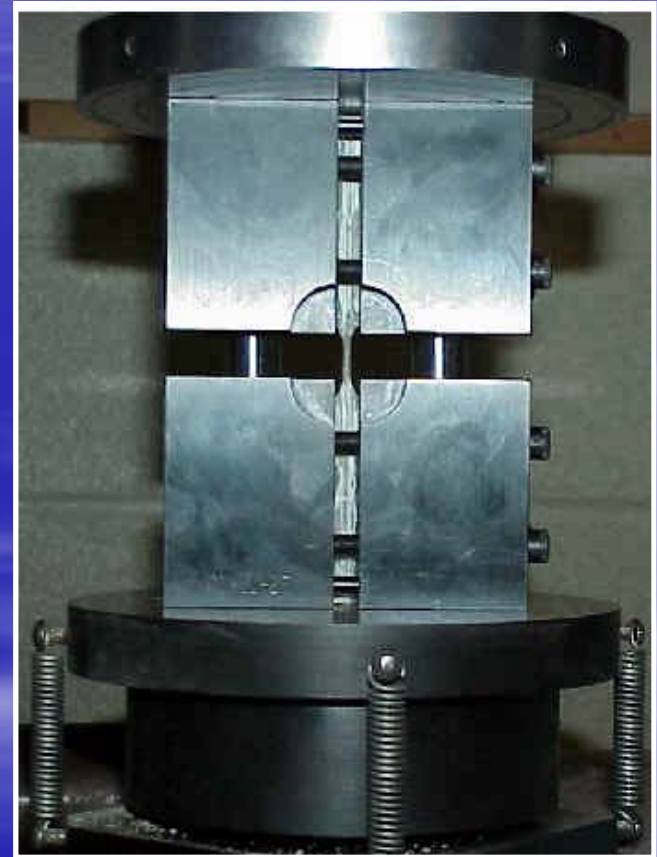


Tensile tester

Mechanics and Materials Lab Facilities



High capacity test frame



Compression test fixtures

Mechanics and Materials Lab Facilities



**Slow strain rate
corrosion machine**

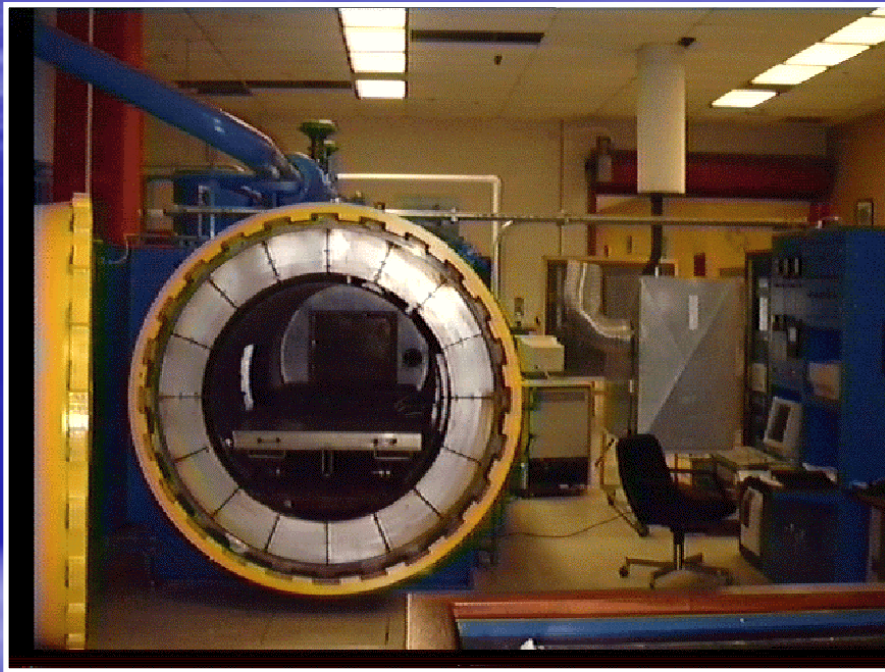


Corrosion chamber



**Drop tower for
dynamic testing**

Mechanics and Materials Lab Facilities

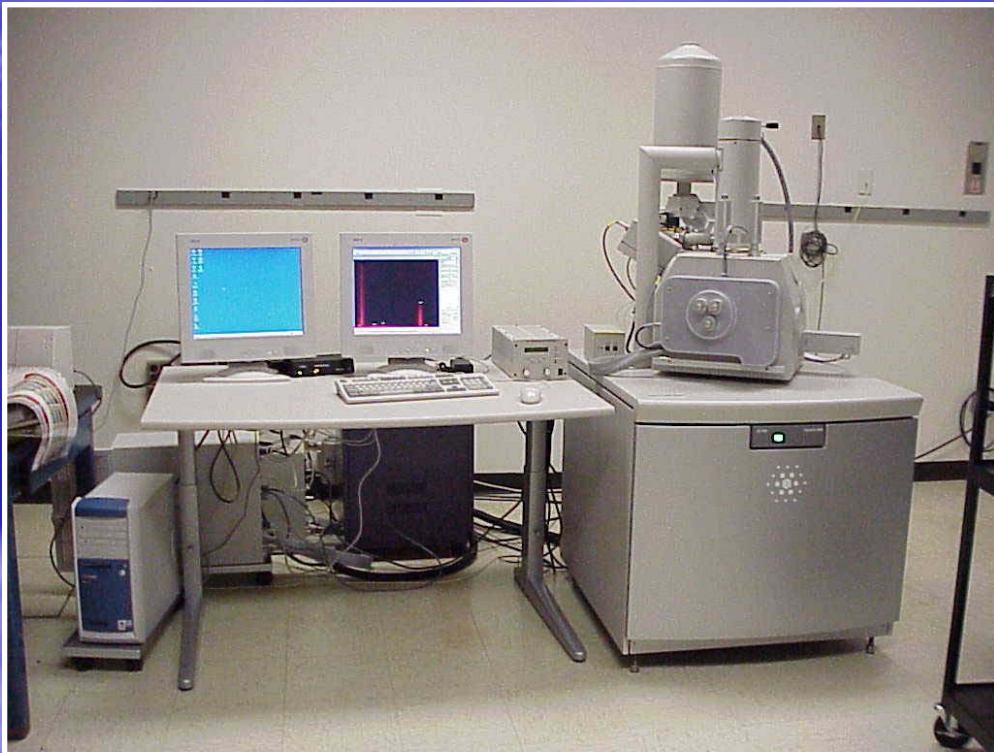


Autoclave

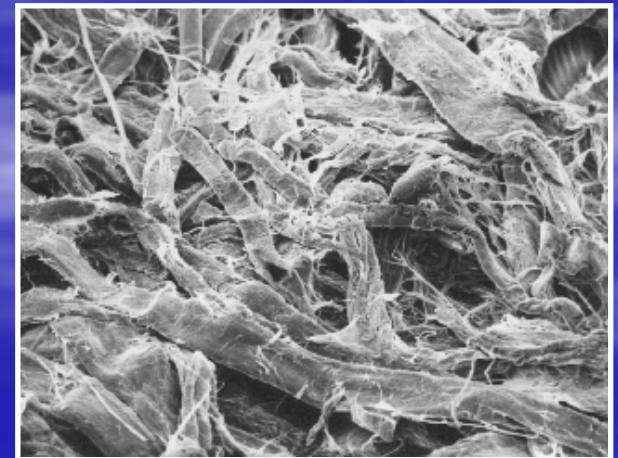
Heat treatment furnaces



Mechanics and Materials Lab Facilities



Scanning electron microscope



Energy and Fluids

Energy and Fluids

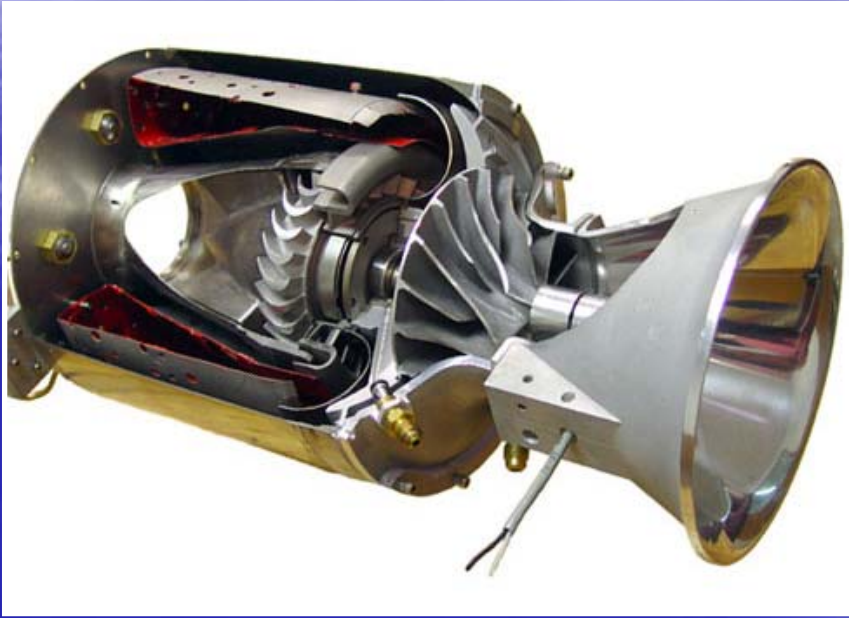
■ Courses

- Engineering Thermodynamics
- Applied Thermodynamics
- Fluid Mechanics
- Heat Transfer

■ Concepts

- How do thermodynamic principles govern the world we live in?
- How do you design a propulsion system?
- Why is ship performance affected by hull design?
- How do you design a cooling system?

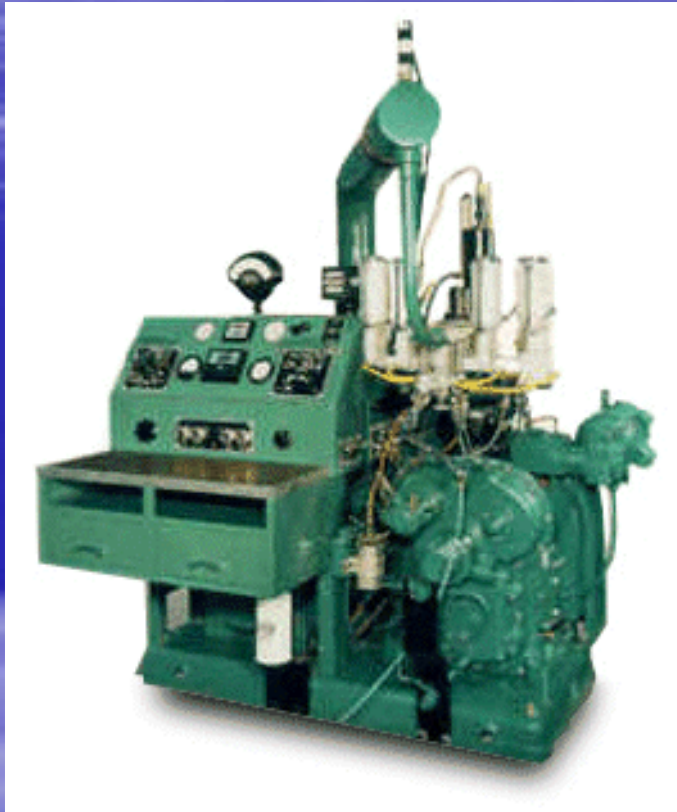
Energy and Fluids Lab Facilities



Gas Turbine Engine



Energy and Fluids Lab Facilities



Single Cylinder Spark Ignition
Engine with Variable Compression
Ratio



Small Engine
Dynamometer

Energy and Fluids Lab Facilities



Refrigeration and Air Conditioning Laboratory

Energy and Fluids Lab Facilities



Subcritical reactor

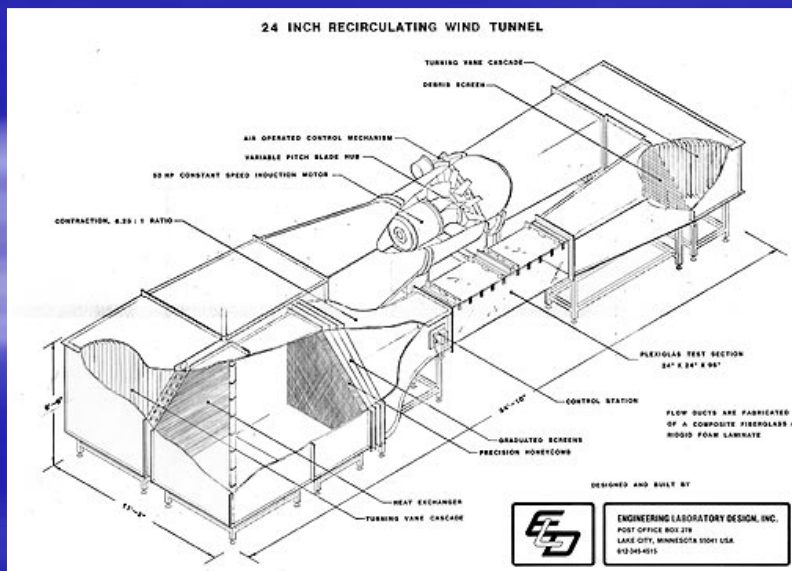


Neutron generator



Nuclear workstation

Energy and Fluids Lab Facilities

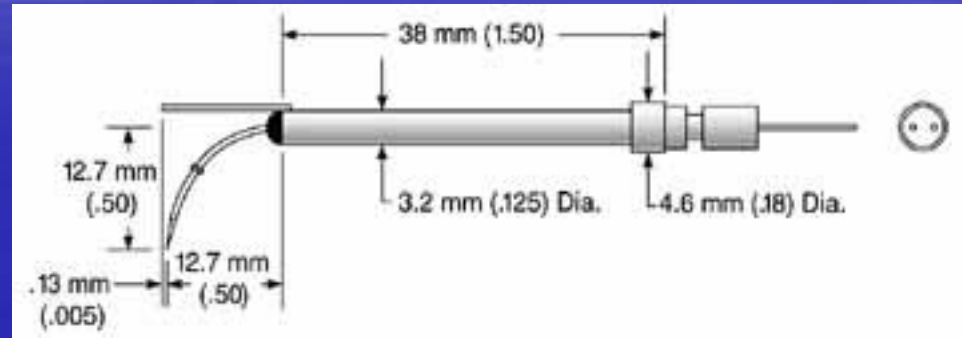


Energy and Fluids Lab Facilities

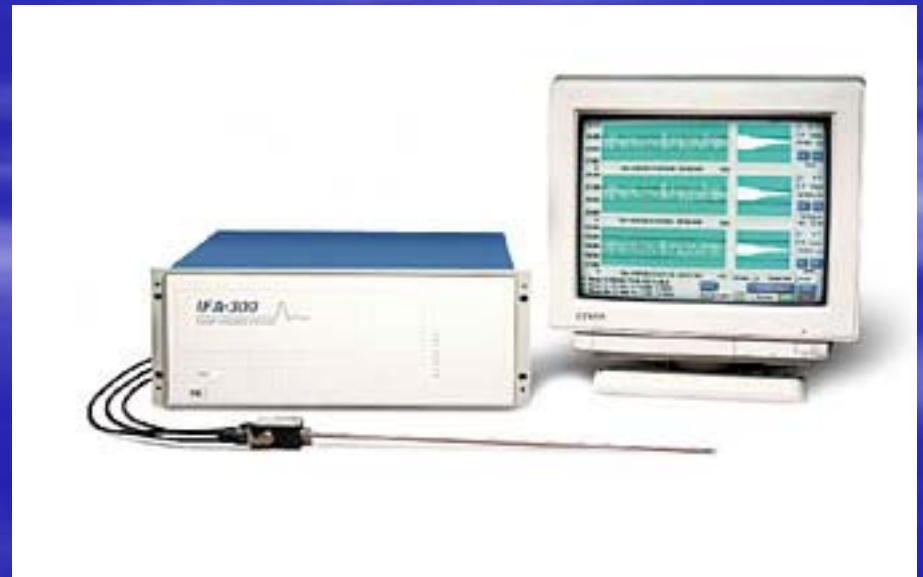
Water Channels



Energy and Fluids Lab Facilities



Fluid Mechanics
Instrumentation
Hot-wire Anemometers



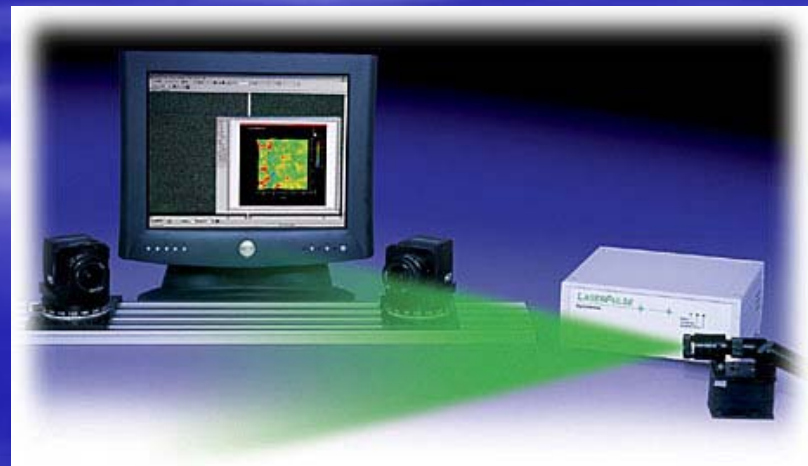
Energy and Fluids Lab Facilities

Fluid Mechanics
Instrumentation

Laser-Doppler
Velocimeter

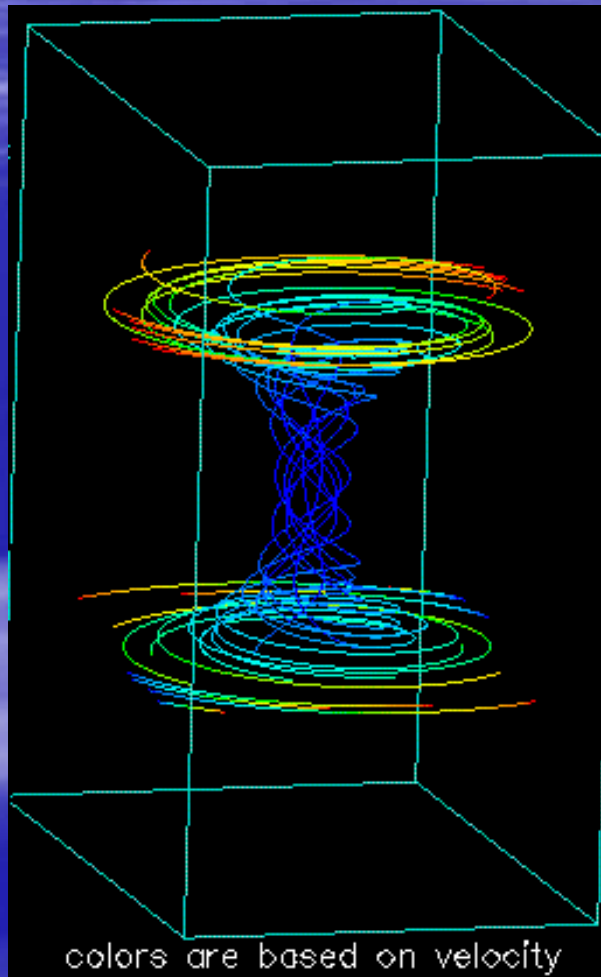


Particle Image
Velocimeter

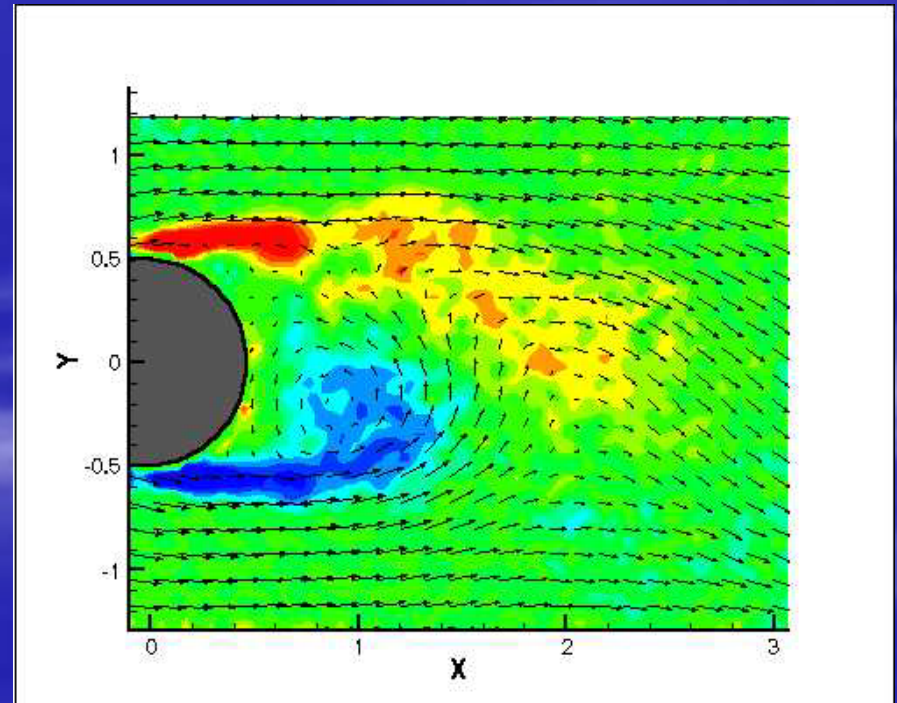


Energy and Fluids

Lab Facilities



Flow visualization and analysis software



Design

Design

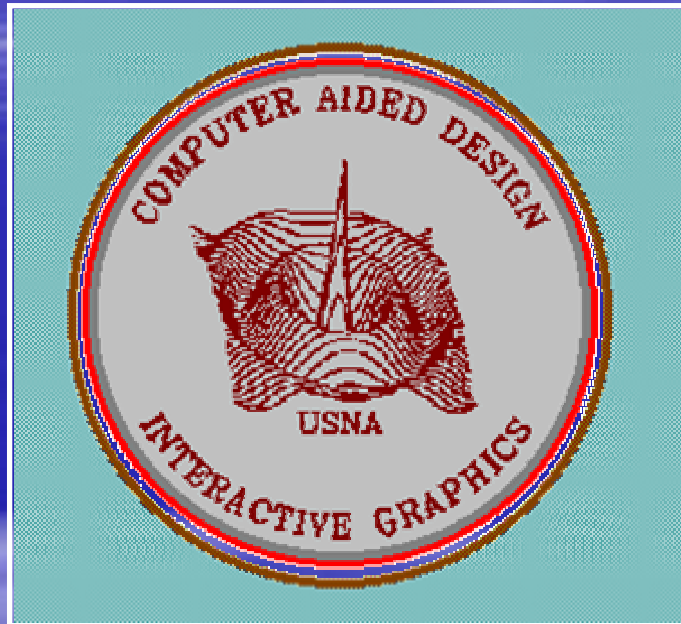
■ Courses

- Intro to Mechanical Engineering
- Experimentation
- Intro to Design
- Computer Aided Design

■ Concepts

- What skills are required in a design engineer?
- How do you adequately test a design?
- How do you design a gear train?
- What software tools are available to the design engineer?

Design Lab Facilities



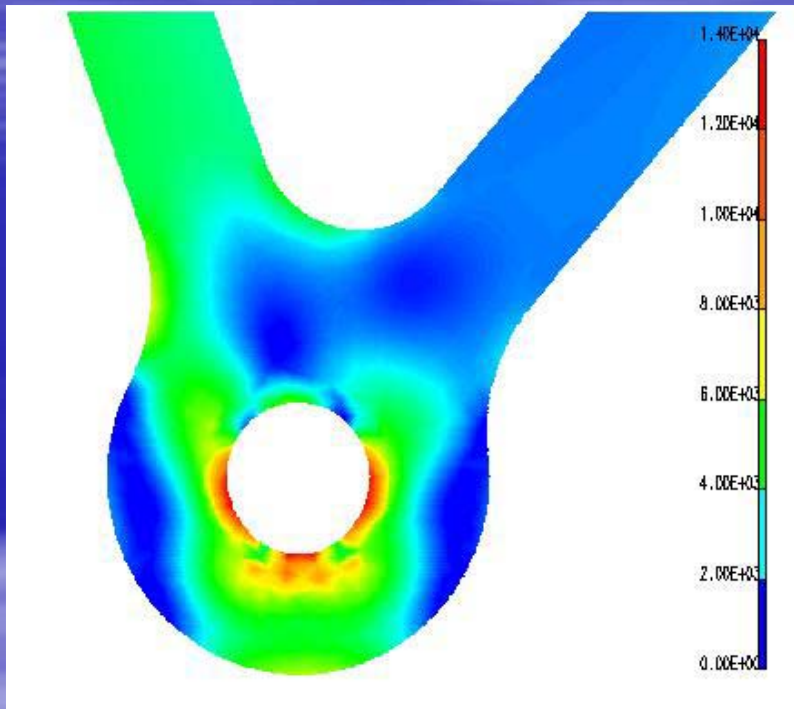
CADIG

**CADIG
Website**



Solid modeling

Design Lab Facilities



Finite element analysis



Experimental verification

Design Project Highlights



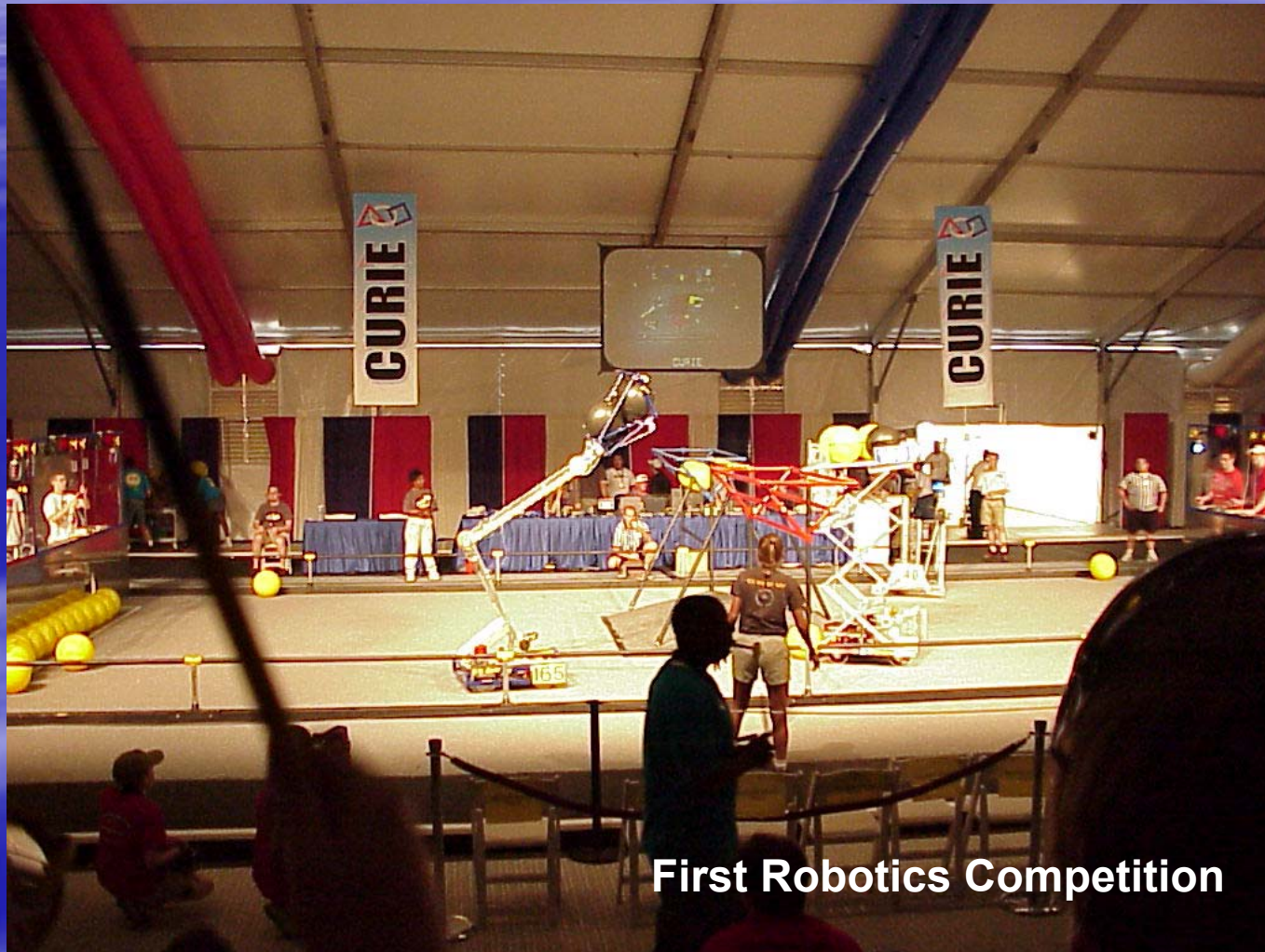
Solar Splash Competition

Design Project Highlights



SAE Competition

Design Project Highlights



Mechanical Engineering Tracks

- Energy Systems : Focuses on the generation, application, and conversion of various forms of energy.
- Engineering Mechanics : Focuses on the analysis of mechanical motion and the design and behavior of structural materials and components.
- Marine Propulsion : Similar to Energy Systems, but specifically focuses on naval applications and the utilization of energy in the marine environment.
- Materials Engineering : Focuses on the analysis, design, and application of advanced engineering materials.
- Nuclear Engineering : Focuses on the generation and application of nuclear power, particularly naval propulsion.

Mechanical Engineering Electives



Electives

Mechanical Engineering Program Objectives

- To provide midshipmen with a strong educational foundation in the specialties of mechanics, material science, energy science, propulsion and thermal fluid sciences.
- To teach students all levels of design and experimentation which relate to mechanical engineering.
- To prepare students for a broad range of career opportunities in the Navy and Marine Corp as well as for graduate studies at other institutions.
- To provide midshipmen with opportunities to work in teams, solve open-ended problems, develop critical thinking skills, and communicate effectively with others orally and in writing.
- To provide midshipmen with an awareness and understanding of professional, ethical, environmental, and legal responsibilities as an integral part of an engineering education.

For More Information

<http://web.usna.navy.mil/~mecheng/>

Questions?